

**Kern River Watershed Coalition Authority**

# **Surface Water Quality Management Plan – Chanac Creek**

Kern County, California  
November 2015

Prepared for:



Prepared by:



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## Abbreviations

CEDEN .....	California Environmental Data Exchange Network
COC.....	Constituent of Concern
CVRWQCB .....	Central Valley Regional Water Quality Control Board
CV-SALTS .....	Central Valley Salinity Alternatives for Long-Term Sustainability
DDE.....	Dichlorodiphenyltrichloroethylene
DDT.....	Dichlorodiphenyltrichloroethane
DWR .....	California Department of Water Resources
EC .....	Electric conductivity
General Order .....	Tulare Lake Basin General Order
IE .....	Irrigation Efficiency
ILRP.....	Irrigated Lands Regulatory Program
KCEHS .....	Kern County Environmental Health Services
KCWA .....	Kern County Water Agency
KRWCA .....	Kern River Watershed Coalition Authority
MRP.....	Monitoring and Reporting Program
NOA.....	Notice of Applicability
SC .....	Specific Conductivity
SQMP .....	Surface Water Quality Management Plan
SWMP.....	Surface Water Monitoring Plan
SWRCB.....	California State Water Resources Control Board
TDS .....	Total Dissolved Solids
USDA .....	United States Department of Agriculture
WDR .....	Waste Discharge Requirements
WQTL.....	Water Quality Trigger Limit



# 1 Introduction

## 1.1 Purpose

Per General Order R5-2013-0120, Waste Discharge Requirements for Growers within the Tulare Lake Basin Area that are members of a Third-Party Group (General Order), if more than one exceedance of the same water quality constituent at the same surface water monitoring location occurs within a three-year period, then a Surface Water Quality Management Plan (SQMP) is required to be developed by the Third-Party Member. The purpose of this SQMP is to provide an approach which the Kern River Watershed Coalition Authority (KRWCA), its grower members, and Central Valley Regional Water Quality Control Board (CVRWQCB) staff may use as a guide for examining and, if necessary, addressing the exceedances of water quality limits through surface water monitoring. Chanac Creek has yielded exceedances recently that triggered the development of a SQMP. The KRWCA aims to stay in compliance with the General Order and, if needed, address surface water quality issues through the approach discussed in this document.

This SQMP is being developed to address exceedances encountered at the Chanac Creek monitoring site, which include: dichlorodiphenyltrichloroethylene (DDE) a byproduct of the legacy pesticide dichlorodiphenyltrichloroethane (DDT) which hasn't been used in active agriculture since the early 1970s, and the micronutrient molybdenum. The KRWCA has also seen exceedances of total dissolved solids/specific conductivity (TDS/SC), and coliforms (Fecal and E. coli), however these Constituents of Concern (COC) require no action by the KRWCA at this time. TDS/SC actions will be subject to specific salinity plans still in development through the Central Valley Salinity Alternatives for Long-Term Sustainability, or CV-SALTS. Fecal Coliform and E. coli, which likely come from surrounding livestock pastures, will be subject to direction provided by a pathogens work group established by the CVRWQCB in 2012, or upon further direction provided by the Executive Officer. The COCs are summarized with their respective water quality trigger limit (WQTL) in **Table 1-1**. If exceedances for other monitored constituents on Chanac Creek trigger the need for a management plan, they will be addressed through addendums to this SQMP, which will be submitted to the CVRWQB for approval. However, the most recent sample at Chanac Creek, taken September 15, 2015, indicated no exceedances of any actionable COCs.

**Table 1-1. Summary of WQTLs for COCs**

Summary of WQTLs for COCs	
Constituent of Concern	Trigger Limit
DDE	.001 ug/L
Molybdenum	10 ug/L
TDS/SC	450 mg/L/700 uS/cm
Coliform (Fecal/E. coli)	235/400 MPN/100 mL

## 1.2 Background

The KRWCA, the Third-Party coalition providing coverage in this Management Plan Area, is a Joint Powers Authority (JPA) that was formed in 2012 by multiple irrigation and water districts in Kern County,



## Section One: **Introduction**

### **Surface Water Quality Management Plan – Chanac Creek**

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and received its Notice of Applicability (NOA) to be a Third-Party coalition on February 4, 2014. The KRWCA boundary generally coincides with the Kern River Watershed boundary (**Figure 1-1**). The total boundary covers approximately 3,580,000 acres however only about 620,000 acres are typically irrigated.

The KRWCA covers a majority of the Kern Subwatershed area on the Central Valley floor (as the primary area), along with the upstream mountain portion of the Kern River Watershed (as a secondary coverage area). The Primary area, which contains most of the irrigated agriculture of the KRWCA, encompasses approximately 1,024,000 acres in total or gross area. The Secondary area, which primarily contains the mountainous regions and little to no agriculture, adds an additional 2,556,000 acres.

The climate of the KRWCA is considered semi-arid to desert, although this varies in the mountainous secondary area. As such, local surface water supplies are limited and irrigated agriculture in the region relies on groundwater supplies and imported surface water supplies from the north. Kern County has the second largest crop-based economic value of agricultural counties in the state and nation, producing over 250 crops; including 30 types of fruit and nuts, over 40 varieties of vegetables, over 20 field crops, lumber, nursery stock, livestock, poultry and dairy products (USDA, 2014). Current irrigation efficiencies in the Kern Subbasin are, overall, some of the highest in the entire Central Valley. Growers also employ efficient nutrient management because fertilizer additions represent another large expense, in addition to the environmental concerns associated with over-application.

The Management Plan Area at focus of this SQMP is the Chanac Creek Watershed, shown in the inset map of **Figure 1-1**. This SQMP only covers the Chanac Creek region. Chanac Creek is located in the Cummings Valley to the west of Tehachapi in the Tehachapi Mountain Range and drains a watershed of about 35,000 acres in the southeastern area of the KRWCA; however, irrigated agriculture only makes up about 10% of this acreage. Much of the irrigated agriculture in this area is also certified organic, which further guides the management practices that are allowed to be implemented. These certifications prohibit some applications typical to standard farming practices (i.e. no pesticide application).

Typically this monitoring location is dry, but due to unusual storm events this past summer, samples have been taken. One such event (July 19, 2015) was attributed to remnants of Tropical Storm Dolores and caused mudslides in multiple locations of the Cummings Valley. These uncontrollable events wreaked havoc not only on the residences in the area, but also farming operations that lost portions of their crops. Further investigation into this rare event is proposed for the Source Identification Study. It is believed this event may have led to exceedances in subsequent sampling, and as we move away from this event, water quality is likely to return to normal, which has been implied by the latest sample (Sep. 15) having no exceedances of any actionable COC's.





## Section One: Introduction

### Surface Water Quality Management Plan – Chanac Creek

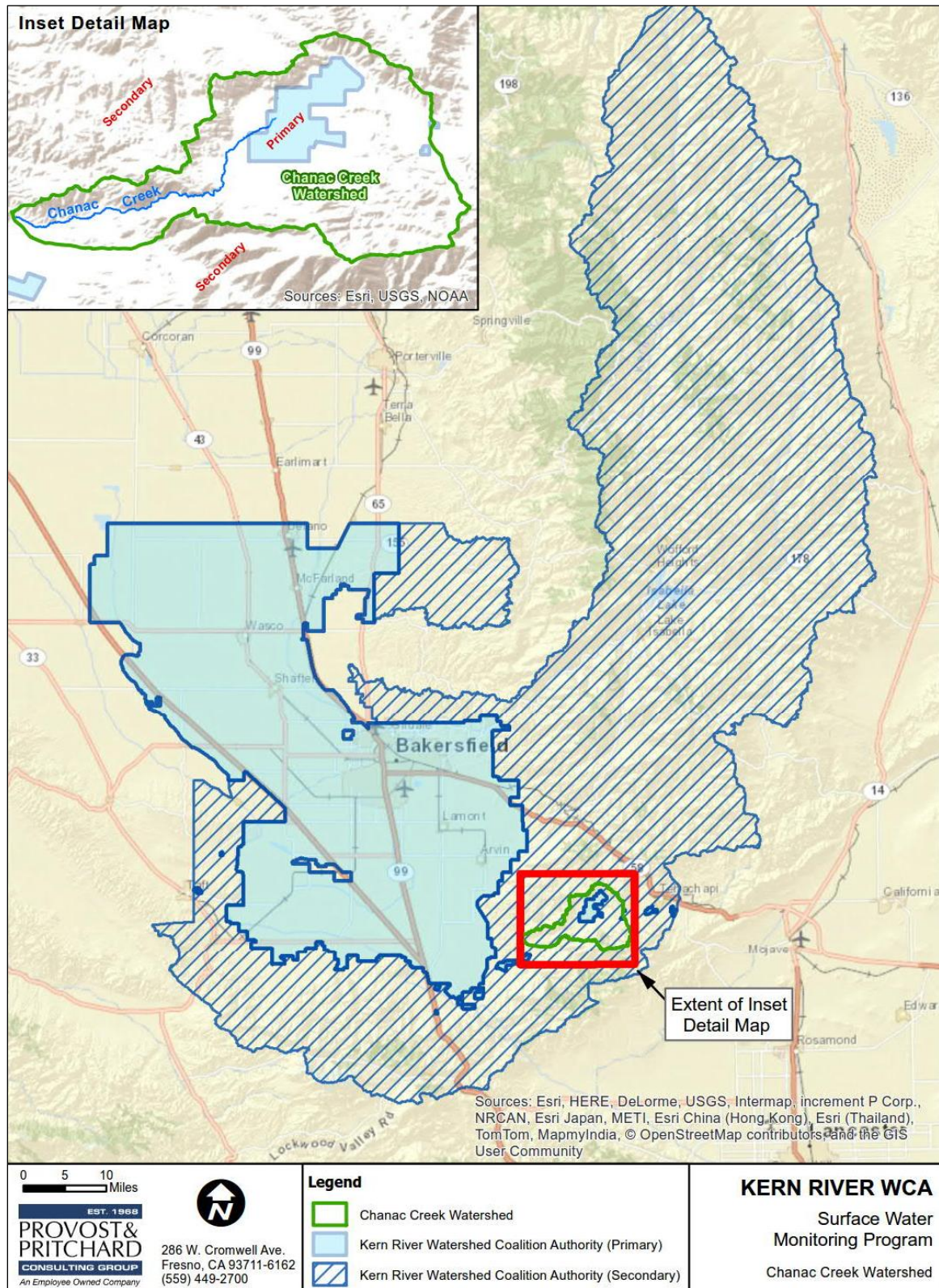


Figure 1-1. SQMP Location Map



## 2 Physical Setting & Information

### 2.1 Chanac Creek Watershed Description

Chanac Creek is located in the Cummings Valley to the west of Tehachapi in the Tehachapi Mountain Range and drains a watershed of about 35,000 acres in the southeastern area of the KRWCA. However, irrigated agriculture only makes up a small portion of this acreage (approximately 10%). Much of the Chanac Creek in the upper watershed is channelized. The Creek begins to follow a more natural alignment near the town of Stallion Springs as it runs through pasturelands and natural landscape before it finally enters Tejon Creek in the foothills near the southeastern extent of the Central Valley; however, water generally is only in Chanac Creek following storm events and rarely makes it out of the foothills and into Tejon Creek. It is important to note that Chanac Creek is located in a valley surrounded by mountains. The creek captures runoff from these mountains during large precipitation events and spring snow melt. These mountains likely play a major role in the quality of water entering the creek. For example, large precipitation events in the past have caused mud slides. Recently, the remnants of tropical storm Dolores caused the worse mudslide in over 30 years on July 19, 2015. These slides are unpredictable and likely cause poor water quality conditions, with displaced soils from the higher elevations entering the creek. **Figure 2-1** shows the topography of the area and the steep mountains surrounding the Cummings Valley.

The Chanac Creek monitoring site was established by the Kern County Water Agency during the conditional waiver that preceded both the KRWCA and the existing General Order. Originally, the Chanac Creek monitoring site was established at a location where the Creek crosses Banducci Rd. Later on, while still under the conditional waiver and at the request of the CVRWQCB, the site was moved to its current location approximately 1.18 miles north of Banducci Rd and 0.8 miles west of Pellicer Rd. This location is near the westerly edge of agriculture along Chanac Creek. In the revised Surface Water Monitoring Plan (SWMP) submitted by the KRWCA, the site was proposed to be moved further downstream on Chanac Creek in an effort to monitor if there are any potential impacts to Chanac Creek from a larger area. Currently, no samples have been taken at this new proposed site. **Figure 2-2** is included to show the historical, current and proposed sampling locations and the dates of samples taken at each location.

Chanac Creek has served as a Core Monitoring Site for the KRWCA. Monitoring follows the Core Monitoring schedule and monitored parameters described in the revised SWMP. Monitoring at this location is used to track surface water quality in a mountainous farming, grazing, and residential region. Farming in this area represents approximately only 10% of the activities and sees a different climate than the farming in the KRWCA Primary Area on the Central Valley floor. Average precipitation ranges from 10 to 14 inches, approximately double the averages on the valley floor. This area also experiences snow and freezing weather not seen on the valley floor.





## Section Two: Physical Setting & Information

### Surface Water Quality Management Plan – Chanac Creek

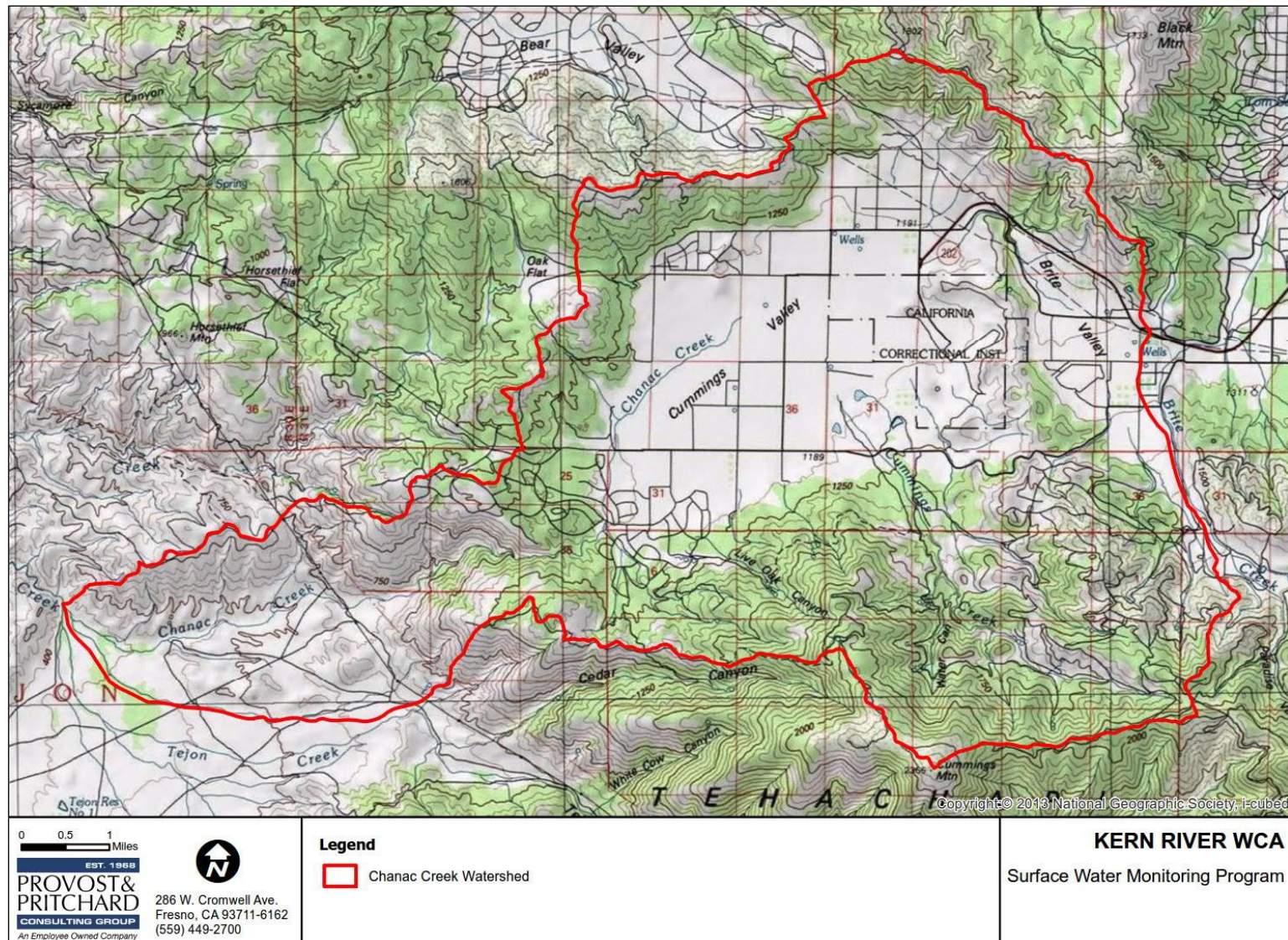
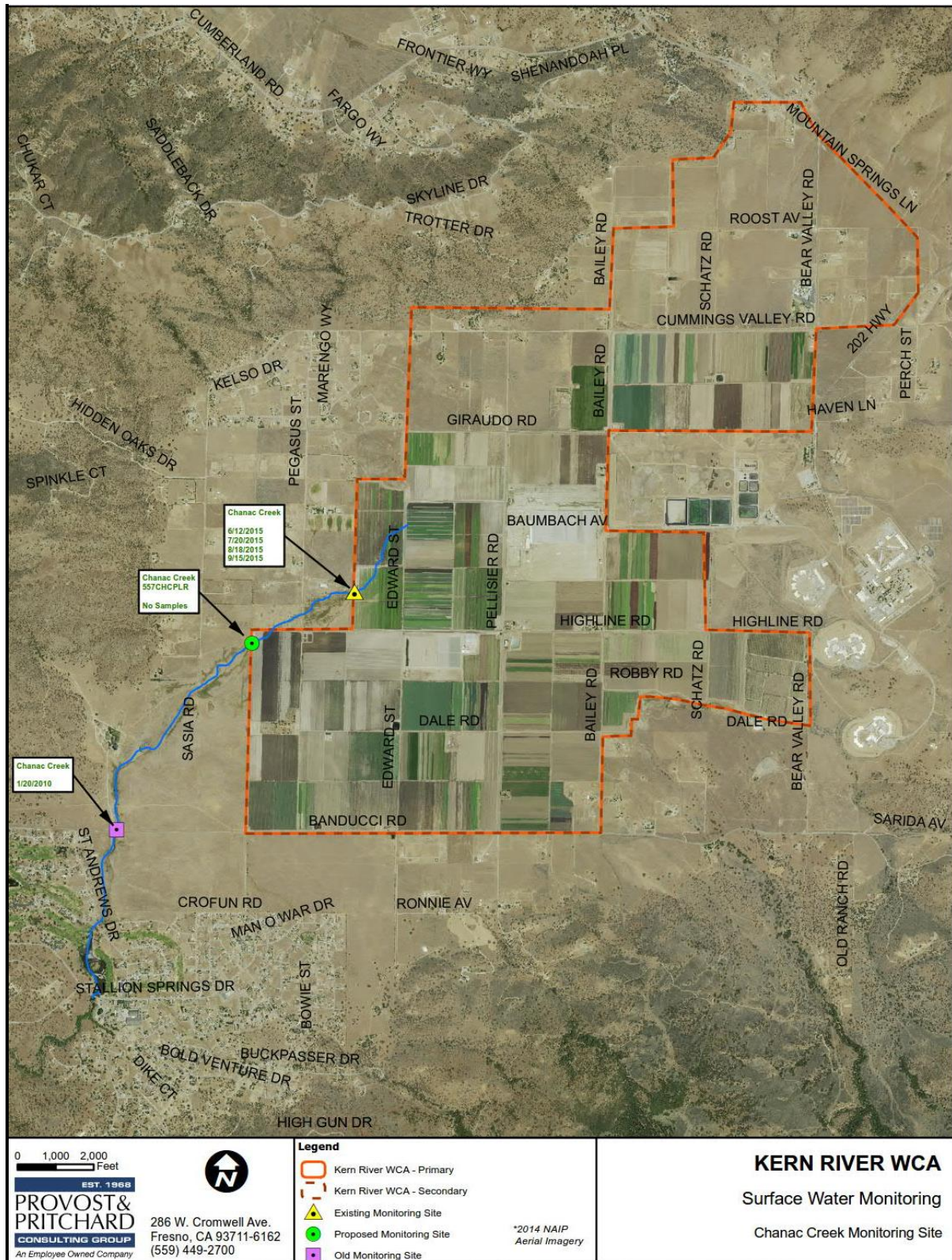


Figure 2-1. Chanac Creek Watershed Topo Map



## Section Two: Physical Setting & Information

### Surface Water Quality Management Plan – Chanac Creek



### Figure 2-2. Location of Chanac Creek Monitoring Site



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### **2.2 Land Use**

Review of current land use, as designated by Kern County Assessor data, shows a wide variety of land uses in the Chanac Creek Watershed, many of which are not related to irrigated agriculture. During the proposed Source Identification Study, all of these land uses will be analyzed further to assess if they are contributing sources to the COCs. **Figure 2-3** and **Table 2-1** represent spatial and tabular summaries of the current land uses in the Chanac Creek Watershed. As shown in the table, non-agricultural lands make up nearly 90% of the area with grazing land and residential making up the majority at approximately 60%. GIS shapefiles will be provided on a CD included with this plan.





## Section Two: Physical Setting & Information

### Surface Water Quality Management Plan – Chanac Creek

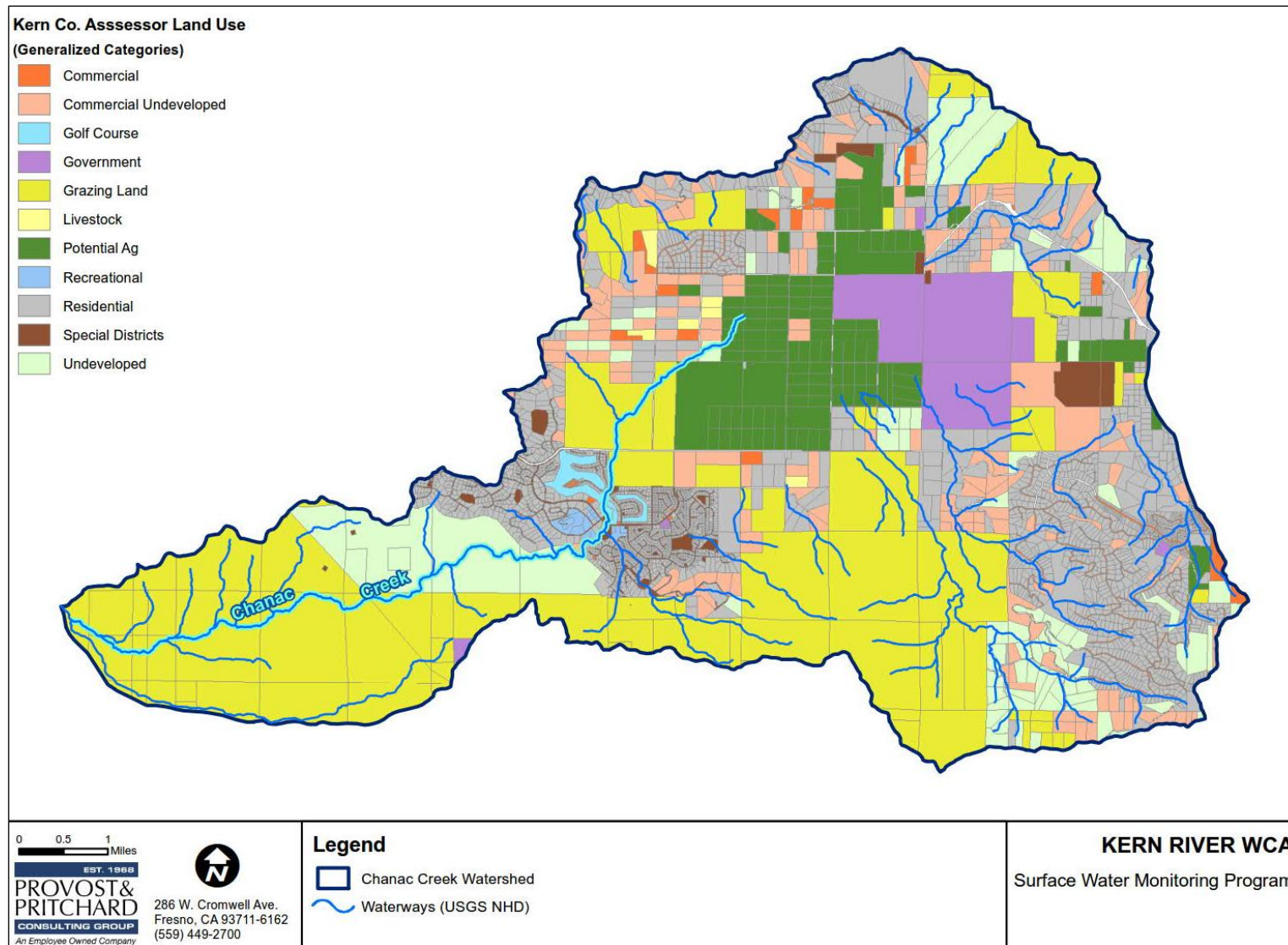


Figure 2-3. Current Land Uses in Chanac Creek Watershed



## Section Two: Physical Setting & Information

### Surface Water Quality Management Plan – Chanac Creek

**Table 2-1. Current Land Use Summary**

Current Land Use Summary		
Assessor Land Use	Acres	Percentage
Commercial	551	1.6%
Commercial Undeveloped	3,283	9.4%
Golf Course	172	0.5%
Government	1,764	5.1%
Grazing Land	12,356	35.4%
Livestock	130	0.4%
Potential Ag	3,321	9.5%
Recreational	94	0.3%
Residential	8,790	25.2%
Special Districts	732	2.1%
Undeveloped	3,689	10.6%
<b>Total:</b>	<b>34,882</b>	<b>100.0%</b>

A cursory review of the irrigated agriculture within the Chanac Creek Watershed was reviewed. The irrigated agricultural area represented by the Chanac Creek Monitoring point makes up a small percentage (approximately 10%) of the total uses in the watershed and is primarily dedicated to multi-cropped systems with few permanent crops. Primary crops within the Chanac Watershed included turf/sod in 2000 but production has shifted to primarily truck crops in 2015. Due to multi-cropping the reported production acres for vegetable cropping systems may sum to a value greater than available irrigable land. Truck crops produced are primarily specialty vegetables and greens, most of which are grown organically. **Table 2-2** summarizes this trend. The table also shows that the actual cropped acreage is less than the acreage for “Potential Ag” indicating agriculture may have even less of an impact.

**Table 2-2. Trend of Chanac Creek Crops**

Trend of Chanac Creek Crops								
	2000		2005		2010		2015	
	Acres	% Total	Acres	% Total	Acres	% Total	Acres	% Total
Alfalfa	65	4%	0	0%	532	23%	0	0%
Field Crops	60	4%	28	1%	0	0%	141	5%
Fruit Tree	63	4%	67	2%	66	3%	54	2%
Grapes	5	0%	0	0%	19	1%	20	1%
Pasture	0	0%	37	1%	37	2%	97	4%
Truck Crops	457	28%	1,270	43%	1,274	55%	2,060	75%
Miscellaneous/Herb	26	2%	73	2%	120	5%	135	5%
Turf/Sod	977	59%	1,452	49%	254	11%	119	4%
Uncultivated Ag	0	0%	40	1%	0	0%	130	5%
<b>Total Irrigated Acres:</b>	<b>1,653</b>	<b>100%</b>	<b>2,967</b>	<b>100%</b>	<b>2,302</b>	<b>100%</b>	<b>2,755</b>	<b>100%</b>



## **2.3 Potential Sources**

The KRWCA is proposing to perform a Source Identification Study to identify potential sources of the COCs requiring a management plan. This study, discussed in more detail in the next section “Management Plan Strategy/Approach,” will include several steps to determine potential sources such as: literature review, site visits, and landowner meetings and surveys. An evaluation report will be developed after the study has been completed. The KRWCA anticipates this evaluation report will dictate much of the remaining steps of the SQMP, if any. It is possible that land uses other than irrigated agriculture may be the source of observed exceedances. It is also possible that the molybdenum exceedance may be attributable to naturally occurring molybdenum, unrelated to any land use. If irrigated agriculture is determined to be an unlikely source, this management plan will conclude after appropriate discussions with CVRWQCB staff, because actions associated with sources other than irrigated agriculture are beyond the scope and mandate of the Kern River Watershed Coalition Authority.

## **2.4 Beneficial Uses**

Chanac Creek is located in Tulare Lake Hydrologic Unit 556 which is classified as “Westside Streams.” **Table 2-3** is included from the Tulare Lake Basin Plan listing the designated beneficial uses associated with the Chanac Creek area. Since Chanac Creek is normally dry, there are usually no beneficial uses available to landowners in the area.





## Section Two: Physical Setting & Information

### Surface Water Quality Management Plan – Chanac Creek

**Table 2-3. List of Beneficial Uses for Chanac Creek (556)**

TABLE II-1														
TULARE LAKE BASIN														
SURFACE WATER BENEFICIAL USES														
Stream	MUN	AGR	IND	PRO	POW	REC-1	REC-2	WARM	COLD	WILD	RARE	SPWN	GWR	FRSH
552, 551 Kings River														
North Fork, Upper					•	•	•	•	•	•	•	•		•
Main Fork, Above Kirch Flat	•					•	•	•	•	•	•	•		•
Kirch Flat to Pine Flat Dam (Pine Flat Reservoir)					•	•	•	•	•	•				•
Pine Flat Dam to Friant-Kern	•	•			•	•	•	•	•	•		•	•	•
Friant Kern to Peoples Weir	•	•		•		•	•	•		•			•	
Peoples Weir to Stinson Weir on North Fork and to Empire Weir No. 2 on South Fork		•				•	•	•		•			•	
553, 558 Kaweah River														
Above Lake Kaweah	•				•	•	•	•	•	•	•	•		•
Lake Kaweah					•	•	•	•		•				•
Below Lake Kaweah	•	•	•	•		•	•	•		•			•	
555, 558 Tule River														
Above Lake Success	•	•			•	•	•	•	•	•	•	•		•
Lake Success		•			•	•	•	•		•				•
Below Lake Success	•	•	•	•		•	•	•		•			•	
554, 557 Kern River														
Above Lake Isabella	•				•	•	•	•	•	•	•	•		•
Lake Isabella					•	•	•	•	•	•				•
Lake Isabella to KR-1 <sup>‡</sup>					•	•	•	•	•	•	•			
Below KR-1 <sup>‡</sup>	•	•	•	•	•	•	•	•		•	•		•	
555, 558 Poso Creek		•				•	•	•	•	•			•	•
552 Mill Creek, Source to Kings River	•					•	•	•		•			•	•
552, 553, 554, 555 Other East Side Streams	•	•				•	•	•	•	•			•	
556, 559 West Side Streams		•	•	•		•	•	•		•	•		•	
551, 557, 558 Valley Floor Waters		•	•	•		•	•	•		•	•		•	

<sup>‡</sup> KR-1: Southern California Edison Kern River Powerhouse No. 1.



## **2.5 Inventory of Existing Management Practices**

An inventory of existing management practices will be further developed during the proposed Source Identification Study. The study is anticipated to include site visits, meetings and surveys with KRWCA members in the management plan region. A cursory visit revealed that some excellent management practices are already in place such as bermed fields, tailwater capture basins, and sprinkler irrigation. The Source Identification Study is expected to provide further insight on any additional drainage and irrigation management practices, along with evaluating crop nutrient and sediment control practices that are in place.

## **2.6 Represented Areas**

In the revised SWMP submitted by the KRWCA, the Chanac Creek monitoring site was proposed to be representative of irrigated agriculture in a mountainous region; however it must be acknowledged that 90% of the activities within the Chanac Creek area are not agricultural and therefore other influences may be observed, which may be difficult to differentiate. The monitoring site decision originally was based on the climate and hydrology differences between the mountain area and Central Valley floor area that can account for different management practices used on farm. This region around Chanac Creek in the Cummings Valley of the Tehachapi Mountains holds the bulk of the “mountain” irrigated agriculture in the KRWCA. The irrigated agriculture, grazing, and residential activities in this region are represented by the Chanac Creek monitoring site however the KRWCA growers will be subject to this SQMP. By necessity, as the source study proceeds, the other activities within this area will be included and considered.

## **2.7 Summary of Existing Data Sources**

Upon further review of the various surface water data sources, there is limited data available in the Chanac Creek watershed. This was expected since Chanac Creek is a small water body that has water intermittently, following larger rain events, and is not the water source for any municipal water uses. Only a search of the California Environmental Data Exchange Network (CEDEN) yielded surface water result data, which was comprised of one sample taken nearly six (6) years ago at the Chanac Monitoring Site. Result data from this lone sample, taken January 20, 2010, showed exceedances for some of the COCs in this SQMP, but also showed some of the COCs not exceeding trigger limits. The KRWCA does not view this data as an accurate representation of current surface water quality conditions given the date of the sample and the significant change in cropping. The KRWCA plans to rely on the recent data and future sampling moving forward.

## **2.8 Summary of Exceedances and Constituents of Concern**

**Table 2-4** is a summary of the actionable COCs that have exceeded trigger limits recently (data results from the last five (5) months, June through October 2015). These COCs have had two (2) exceedances. The last sample taken on September 15 indicated no exceedances of actionable COCs.



## Section Two: **Physical Setting & Information**

### Surface Water Quality Management Plan – Chanac Creek

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**Table 2-4. Summary of Exceedances Requiring Action at Chanac Creek Monitoring Site**

Summary of Exceedances Requiring Action at Chanac Creek Monitoring Site	
Constituent of Concern	Tally*
Molybdenum	2
DDE	2

Notes:

1. \* Tally includes sampling through October 2015 (5 months)



## 3 Management Plan Strategy/Approach

### 3.1 Approach Outline

The steps for the proposed KRWCA strategy for completing this SQMP are listed below.

1. Prioritization
2. Review Data & Regulatory Basis for Exceedances
3. Source Identification Study
4. Management Practice Implementation
5. Performance Goals and Criteria
6. Monitoring
7. Evaluation of Effectiveness
8. Roles and Responsibilities
9. Reporting

The KRWCA has developed its approach to rely heavily on the proposed Source Identification Study. Findings from this study are expected to direct further actions under this management plan such as: member outreach and education, management plan implementation, surface water monitoring, and evaluation, if all these steps remain necessary following the study. The KRWCA believes this strategy allows for gaining proper knowledge of the management plan area in order to appropriately address the COCs in an effort to protect surface water quality and comply with receiving water limits specified by the General Order, with the realization of the relatively limited agricultural activity that occurs in the area. Additional knowledge gained from the study may reveal that these COCs are likely not related to irrigated agriculture and that further action associated with this SQMP would not be appropriate. Additional detail is provided for each step of the proposed approach. It is important to note that proposed actions and schedules are subject to change pending the evaluation of findings from the Source Identification Study.

### 3.2 COC Prioritization and Rationale

With two COCs triggering a management plan, the KRWCA is proposing to address the constituents in a prioritized manner. COCs viewed as higher water quality issues will be addressed first during management practice implementation, and as the process for implementation and evaluation is well underway for the first priority, the next priority constituent will be brought into the process. It is important to note that at this time the KRWCA does not believe any of the current COCs triggering this plan require an “extreme” or “high” level priority such as seen in other CVRWQCB-approved management plans (i.e. Registered Pesticides or Toxicity). Additionally, while the KRWCA will focus first on its higher priority constituents, this prioritized approach is a guideline that may be modified in the future. As studies (i.e. Source Identification) and evaluations are conducted it may become evident that specific constituents need to be addressed as appropriate and not necessarily according to the original priority level. The following **Table 3-1** summarizes the priorities for COCs triggering action in this management plan.



## Section Three: Management Plan Strategy/Approach

### Surface Water Quality Management Plan – Chanac Creek

**Table 3-1. Summary of Management Plan Prioritization for COCs Requiring Action**

Summary of Management Plan Prioritization for COCs Requiring Action			
Constituent of Concern	Category	Priority	Priority Rationale
DDE	Legacy Pesticides	Intermediate	Limited potential to adversely affect aquatic life. High probability of legacy agricultural and government origins.
Molybdenum	Trace Metals	Intermediate	Intermediate potential for toxicity to livestock and beneficial uses, however a strong possibility of natural occurrences.

### 3.3 Review Data & Regulatory Basis for Exceedances

This step is included as a check on the different programs, trigger limits, and appropriate beneficial uses. Programs, regulations, and workgroups are regularly occurring and/or changing and may govern how a water quality issue is handled.

### 3.4 Source Identification Study

The KRWCA is proposing to perform a Source Identification Study to gain a better understanding of the COCs in this SQMP requiring action (DDE and molybdenum). This study will include research on these COCs so that a thorough evaluation of potential sources can be performed. We currently understand that DDE is a legacy issue and molybdenum can be naturally occurring, and that only approximately 10% of this area is engaged in agricultural activity. Consequently, these two COCs may be beyond the control of the agricultural activity or exceedances may have been associated with unusual rain events, one of which caused a mudslide unseen in this area for decades. However, to move forward, a Source Identification Study will be conducted. This research will include a review of natural occurrences of COCs and also possible products containing COCs and where or how they might be applied. The Study will also look into whether a COC may be a byproduct of another constituent, which is likely the case for DDE as a legacy issue, and the sources of the parent constituent. Once potential sources of COCs are understood, the KRWCA will use the information to evaluate the management plan area for these potential sources. The evaluation will include review of available data sources (i.e. Agricultural Commissioner data), management practice surveys for KRWCA members, and site visits. These tools will be used to determine if direct discharges can be found or if the possible pathways can be delineated. Once the study has been performed, the results and evaluations will be compiled into a Source Identification Study Evaluation Report. This report will then be used to guide the remaining tasks of this SQMP, if still necessary. Further detail for actions planned during the Source Identification Study are provided in the following sub-sections.

#### 3.4.1 Research COCs

To effectively identify the source of COC's triggering this SQMP, thorough evaluation of available information regarding application and potential pathway to surface water will be performed. One of the



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COCs to be studied is DDE, which is known to be a legacy issue, since it originates from a material that has not been used for decades. Relevant information to research includes:

1. Literature Review of COC sources;
2. Product review of COC sources;
3. Chemical application records; and,
4. Pesticide Use Report records.

### **3.4.2 Evaluation of Existing Conditions**

Existing practices and conditions will be evaluated to determine where potential sources of COCs may be located and serve as a baseline for any management practice changes associated with this SQMP. Existing conditions for uses in the watershed will be evaluated to determine if possible sources are related to current irrigated agriculture, which is suspected to likely not be the case for at least one COC (DDE). This evaluation may also help future identification of potential management practices to be implemented in future steps of this SQMP. Relevant existing conditions to be evaluated include:

1. Existing practices on fields near Chanac Creek;
2. Existing practices used on fields within the watershed;
3. Evaluation of potential non-agricultural sources such as residences and natural processes;
4. Grower surveys and meetings to determine irrigation and nutrient practices; and,
5. “Spot” water quality sampling of potential sources.

### **3.4.3 Monitoring**

The existing surface water monitoring and sampling effort will continue to be performed at the monitoring site throughout this process to see if trends or changes are found. Continued monitoring on September 15<sup>th</sup> saw no exceedances of actionable COCs. Additional sampling may occur during the study in an effort to narrow down potential sources, but a new dedicated site is not expected at this time.

### **3.4.4 Schedule**

The proposed Source Identification Study is anticipated to take place over six (6) months after approval from the Executive Officer. Once the study is complete a Source Identification Study Evaluation Report will be developed to evaluate the findings of the study and reevaluate the framework of this SQMP. These findings have the potential to greatly impact the direction of this SQMP, and so the KRWCA wishes to devote a significant amount of time studying the COCs and the management plan area. See **Figure A-1** in **Appendix A** for the proposed schedule. The schedule includes time for the 30 day public review and Executive Officer review and approval as specified in the General Order.

## **3.5 Management Plan Practice Implementation**

Implementation of management practices may begin, if necessary, after the Source Identification Study Evaluation Report has been completed. Through this effort the KRWCA expects to gain a better understanding of the potential sources of the COCs and which management practices may best fit the different conditions present in the management plan area. This better understanding of potential



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sources may allow for the selection of management practices that are technically and economically feasible and have proven effective at protecting surface water quality.

Education and Outreach meetings with KRWCA member growers in the management plan area will be held to provide information on findings from the Source Identification Study and discuss proposed management practices for implementation, if needed. Continued contact with individual members will be initiated to check status of implementation and provide additional information, if necessary. Continued contact will be maintained primarily via phone calls and emails, but can include on-site meetings upon request.

A tentative schedule is provided in **Figure A-2** of **Appendix A** laying out a potential plan for management practice implementation. Since the Management Plan Area is not large and does not have a significant number of KRWCA members, each member may be required to implement a proposed management practice within the first year of implementation so that proper evaluation can occur. However, as stated previously, this schedule is subject to change based on evaluation of findings from the Source Identification Study. For example, if current irrigated agriculture is determined not to be a potential source of a COC then implementation of management practices would not be necessary. If significant changes are needed following the Source Identification Study, a revised approach and schedule will be provided to the CVRWQCB for review and approval.

### **3.6 Performance Goals and Criteria**

Ultimately, the goal of this SQMP is to protect surface water quality in the management plan region from impacts of irrigated agriculture, if any. This goal would be met by the successful completion of the SQMP by determining that irrigated agriculture is not the source of the water quality issue(s) or through successful management practice implementation. However, to track management plan performance and reach the end goal, interim goals and criteria are needed. The interim goals listed below are related to the various steps the KRWCA has laid out in its approach for completing the SQMP.

1. Identify potential sources causing exceedances of the COCs in the management plan region:
  - a. Not irrigated agriculture?
  - b. Irrigated agriculture with direct point source to be fixed?
2. Grower Outreach and Education meetings to disseminate information to members in the management plan region:
  - a. Track information/handouts shared at meetings
  - b. Track attendance of members at meetings (goal of 100% attendance)
3. Review Implementation of Management Practices:
  - a. Gather existing management practices for baseline
  - b. If appropriate, track implementation of proposed practices by members in the management plan region (goal of 100% implementation within first year)
4. Evaluation of Effectiveness:
  - a. Track water quality concentrations of COCs in relation to trigger limits
  - b. If appropriate, track if management practices prevent discharge to surface water (remove source)

Again, these goals and performance measures are subject to change following the Source Identification Study. For example, if irrigated agriculture is determined not to be a potential source of a COC then





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implementation of management practices would not be necessary. Significant changes in the performance goals and criteria will be submitted to the CVRWQCB for review and approval.

### **3.7 Participants and Responsibilities**

Key individuals involved with this SQMP and their roles are described below. An organizational chart is also provided in **Figure 3-1**.

**KRWCA Board:** KRWCA Board determines and approves policies and action items. The Board meets monthly to provide oversight on financial matters and approval of reports to the CVRWQCB. The Board will work with the Program Manager and Consultant throughout this management plan process.

**Nicole Bell:** Ms. Bell is the Program Manager of the KRWCA. Ms. Bell is in charge of daily operations of the KRWCA which includes oversight of the Consultant contract and work items. Ms. Bell will work closely with the Consultant and KRWCA members within the Management Plan Area to make sure all requirements of the SQMP are completed.

**Matt Klinchuch:** Mr. Klinchuch is a consultant for the KRWCA and is the lead for the surface water monitoring program. Mr. Klinchuch is responsible for developing and implementing the surface water monitoring program, which includes this SQMP. Mr. Klinchuch will oversee most components of this SQMP including the technical analysis, water quality sampling, and data management and evaluation.

**Calvin Monreal:** Mr. Monreal is a consultant for the KRWCA and is the Quality Assurance manager for the surface water monitoring program. Mr. Monreal will aid in many of the technical aspects of this SQMP.

**BSK & Associates:** BSK is the contract laboratory of the KRWCA to perform water quality sampling and analysis. BSK will work at the direction of Mr. Klinchuch on routine monthly sampling and “spot” sampling.

**KRWCA Members:** The KRWCA Members in the Management Plan Area will also be involved and play key roles in this SQMP. These members will be asked to provide information and input during the Source Identification Study and will also be required to implement management practices, as appropriate, while the SQMP is in effect.





### Section Three: Management Plan Strategy/Approach

#### Surface Water Quality Management Plan – Chanac Creek

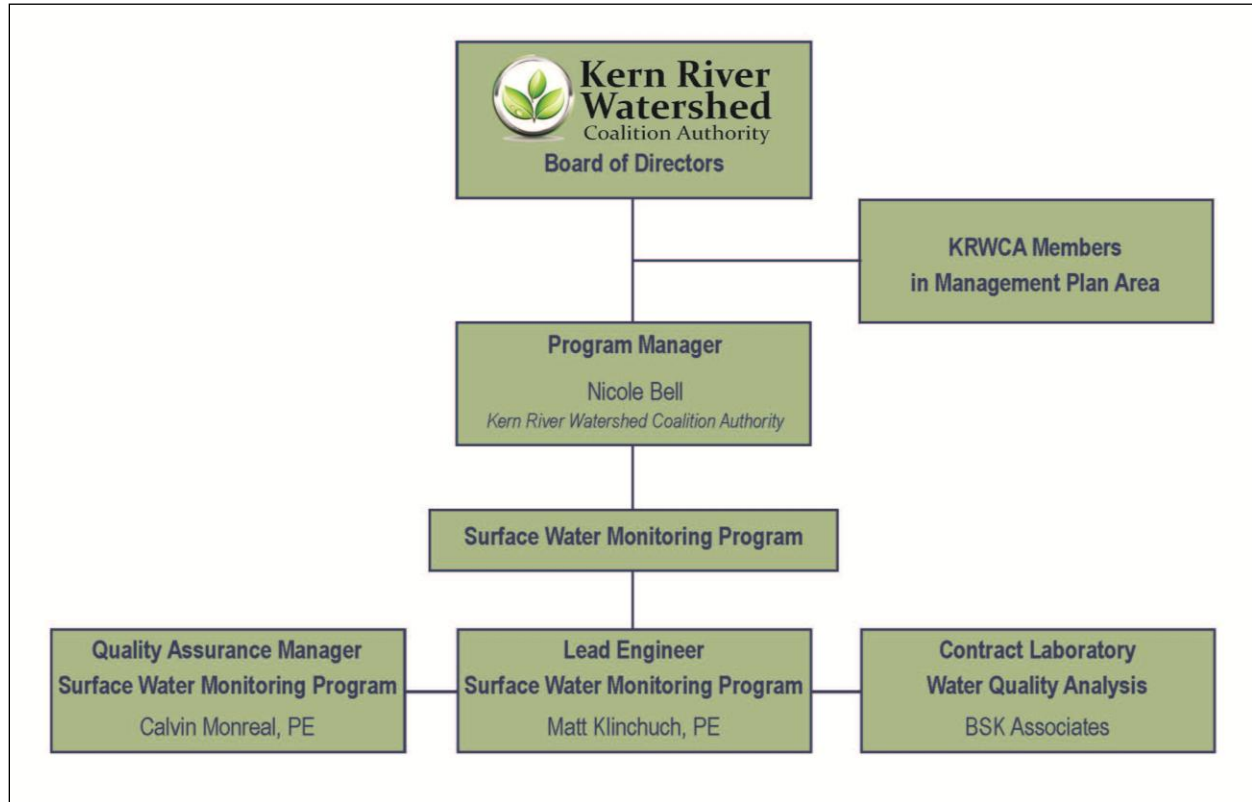


Figure 3-1. SQMP Organizational Chart



## **4 Monitoring Methods**

### **4.1 Location**

Effective surface water monitoring and sampling plays a key role in the success of a management plan. The need for additional monitoring locations will be determined primarily from the results and evaluation of the Source Identification Study. Ultimately, the concern for water quality is focused near where water leaves the extent of irrigated agriculture. For this reason, the KRWCA does not anticipate adding new monitoring sites as part of this SQMP. However, “spot” sampling may occur for the COCs in other locations within the Chanac Creek Watershed during the Source Identification Study, if necessary, to potentially narrow down contaminant sources. Locations of these “spot” samples will be identified and GPS coordinates will be provided.

### **4.2 Schedule and Frequency**

The existing monthly monitoring and sampling will continue following the protocols and frequencies laid out in the KRWCA’s revised SWMP and Quality Assurance Project Plan (QAPP). This will allow for continued tracking of surface water quality data in order to evaluate quality trends.

### **4.3 Data**

Surface water result data collected, either from the existing site monitoring or “spot” sampling, will be included in quarterly electronic data submittals as required under the Monitoring and Reporting Program (MRP) of the General Order.



## 5 Data Evaluation

### 5.1 Methods for Evaluation

Several different data types will be collected as part of this SQMP:

1. Surface water monitoring data;
2. Existing management practices used by KRWCA members in the management plan area;
3. Recommended management practices based on evaluation of the Source Identification Study, and their implementation by KRWCA members in the management plan area; and,
4. Land Use and corresponding nutrient/amendment/pesticide application data.

This information will be collected through surveys from KRWCA members in the region and public agencies that collect these different data types (i.e. Pesticide Use through Ag Commissioner's Office). Data collected will be verified through site visits and meetings held in the management plan region.

Management plans are only as effective as the ability to evaluate the data collected during implementation. The data components gathered as part of this SQMP will need to be properly evaluated in order to gauge progress toward the ultimate goal of protecting surface water quality. The tools the KRWCA will use to evaluate the data collected will primarily be through the use of spreadsheets, databases, and GIS tools. Spreadsheets will be used to compile data and compute statistics such as: concentration trends for the COCs (% change), tracking frequency of exceedances, and, if necessary, tracking number of growers implementing management practices (% of total). If additional or revised management practices need to be implemented, the evaluation will also analyze water quality improvement and the degree to which management practice implementation appears to have an effect. This will allow the KRWCA to understand if the implemented practices are effective and/or if discharges are coming from another location. Spreadsheets will also be used to provide tabular presentation of data for annual and progress reporting. GIS will be used to provide any spatial representation needs during this process such as showing parcels/fields that have implemented management practices and their proximity to Chanac Creek.

### 5.2 Evaluating Program Effectiveness

The data collected and the tools used for evaluation discussed in the previous section will be key to evaluating the progress and eventual completion of the SQMP and meeting the performance goals laid out in **Section 3.6**. The potential sources and practices found during the Source Identification Study, successful implementation of the management practices, and Education and Outreach with KRWCA member growers will be geared to the ultimate goal of protecting surface water quality. The KRWCA hopes to move quickly to determine sources of issues, if possible, and share this information with growers in the KRWCA so that proper changes can be made, if necessary. Moving forward through the SQMP and beyond, much of the needed data is expected to be included in Farm Evaluation Plans, which will be required in the future. Evaluation of these plans will hope to fully demonstrate continued implementation of better management practices or may reveal where practices can be improved.



## 6 Reporting and Review

### 6.1 Reporting

SQMP reporting will be performed in two ways: an Annual Status Report, and Quarterly Reporting

#### 6.1.1 Annual Reporting

Annually on May 1 during each year that the SQMP is in place, the KRWCA will submit a Management Plan Status Report summarizing the progress made in the previous reporting period. The reporting period is proposed to be the Water Year (October 1 – September 30), consistent with the remainder of the surface water monitoring program. The Status Report will be submitted with the Annual Monitoring Report and will contain the 13 mandatory components listed in Appendix MRP-1 of Attachment B of the General Order. These components are also listed below for clarity.

1. Title Page;
2. Table of Contents;
3. Executive Summary;
4. Location map(s) and a brief summary of management plans covered by the report;
5. Updated table that tallies all exceedances for the management plans;
6. A list of new management plans triggered since the previous report;
7. Status update on preparation of new management plans;
8. A summary and assessment of management plan monitoring data collected during the reporting period;
9. A summary of management plan grower outreach conducted;
10. A summary of the degree of implementation of management practices;
11. Results from evaluation of management practice effectiveness;
12. An evaluation of progress in meeting performance goals and schedules; and,
13. Any recommendations for changes to the management plan.

#### 6.1.2 Quarterly Reporting

Data and progress reporting will be submitted quarterly, coinciding with submittals required for the Monitoring and Reporting Program (MRP) of the General Order. These submittals will include any surface water monitoring data specific to this SQMP and a brief status on the progress of various components of the management plan. Quarterly submittal dates are listed in **Table 6-1**.

**Table 6-1. Quarterly Reporting Schedule**

Quarterly Reporting Schedule	
Reporting Period	Due Date
October 1 <sup>st</sup> through December 31 <sup>st</sup> of previous calendar year	March 1 <sup>st</sup>
January 1 <sup>st</sup> through March 31 <sup>st</sup> of same calendar year	June 1 <sup>st</sup>
April 1 <sup>st</sup> through June 30 <sup>th</sup> of same calendar year	September 1 <sup>st</sup>
July 1 <sup>st</sup> through September 30 <sup>th</sup> of same calendar year	December 1 <sup>st</sup>



## **6.2 Periodic Review**

Per guidelines provided in Appendix MRP-1 of Attachment B of the General Order, at least once every five years, CVRWQCB intends to review available data and determine whether an approved management plan is resulting in water quality improvements. Evaluation of the sufficiency of a management plan will be based on review of the data and meetings with the third-party and other interested parties. A determination will be made by the Executive Officer on the progress of the management plan (adequate or inadequate). An inadequate determination may result in revisions to the management plan, implementation of a field monitoring study plan, on-site verification of management practice implementation, or revoking third-party coverage for individual operations and issuing Individual Waste Discharge Requirements. The KRWCA understands the provisions of the Periodic Reviews and will strive to progress as quickly as feasible when working through triggered management plans. If present, the KRWCA wishes to correct irrigated agriculture-related water quality issues quickly in order to complete and remove management plans.



## 7 Management Plan Completion

### 7.1 Pathways of Completion

The goal of the KRWCA is to improve surface water quality issues quickly, if possible, and to complete its SQMP. Successful completion will ultimately be determined by the Executive Officer, but the KRWCA views the following as potential pathways for successful management plan completion:

1. Irrigated Agriculture is not the source.
2. Management Practices resolve the water quality problem:
  - a. Demonstration through monitoring data that the water quality problem is no longer occurring;
  - b. Documentation of education and outreach to members in impaired watershed;
  - c. Documentation of implementation of management practices; and,
  - d. Demonstration management practices are effective.
3. Irrigated Ag is a potential source, but compliance with water quality objectives is not achievable by reasonable and economically feasible agricultural management practices.
4. No conclusion can be reached regarding the probable sources of exceedances, and reasonable efforts to identify the sources have been exhausted.

### 7.2 Completion Flow Chart

A Management Plan Completion Flow Chart is provided as **Figure 7-1** to illustrate the possible pathways. Specific information and data will be documented to show progress through the completion flow chart. This information will be provided in the annual Status Report and other progress meetings, as necessary.



## Section Seven: Management Plan Completion

### Surface Water Quality Management Plan – Chanac Creek

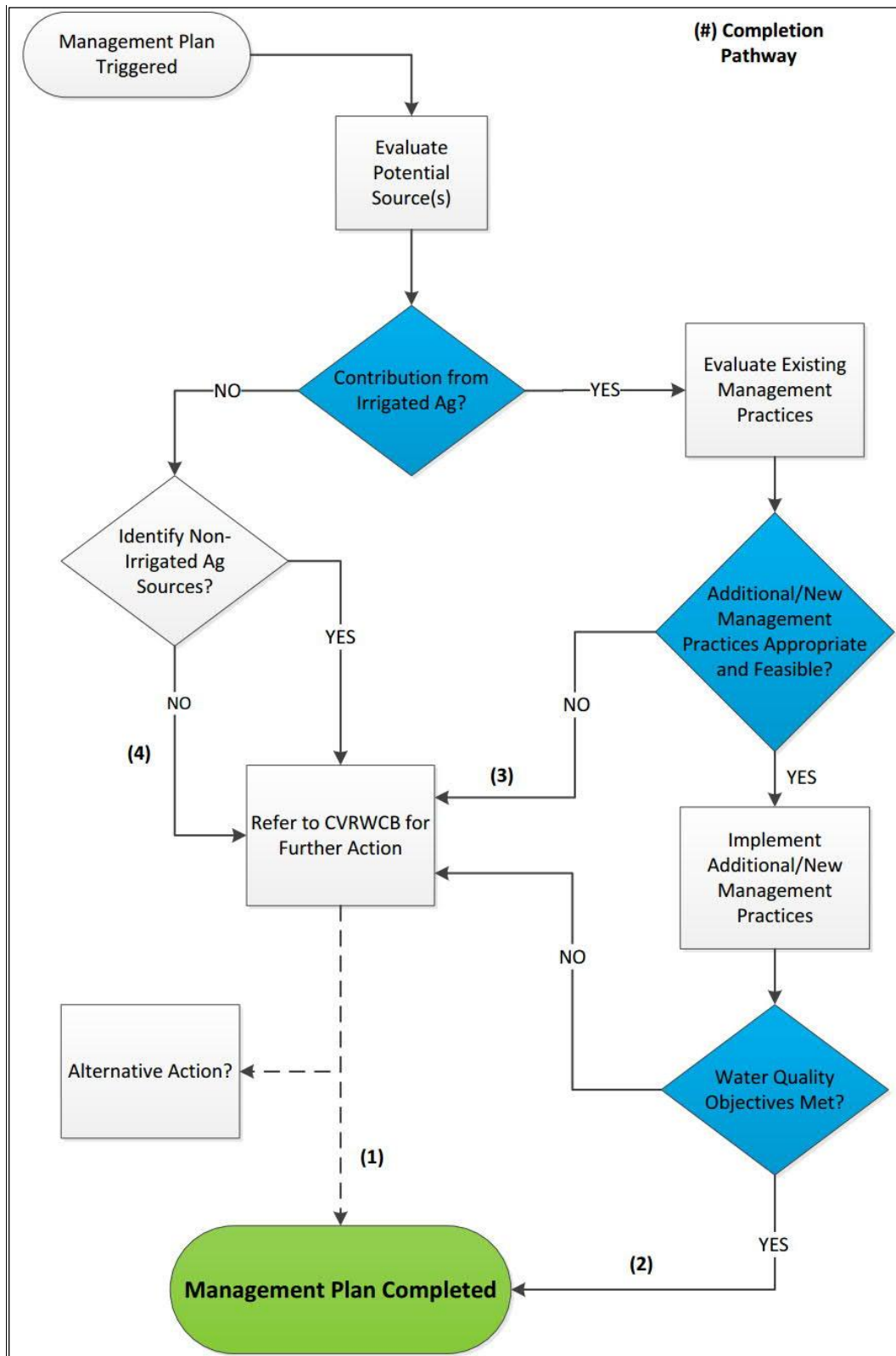


Figure 7-1. Management Plan Completion Flow Chart



# **Appendix A**

# **SQMP Schedules**

**Surface Water Quality Management Plan – Chanac Creek**





Anticipated Schedule assuming management plan completion after the Source Identification Study

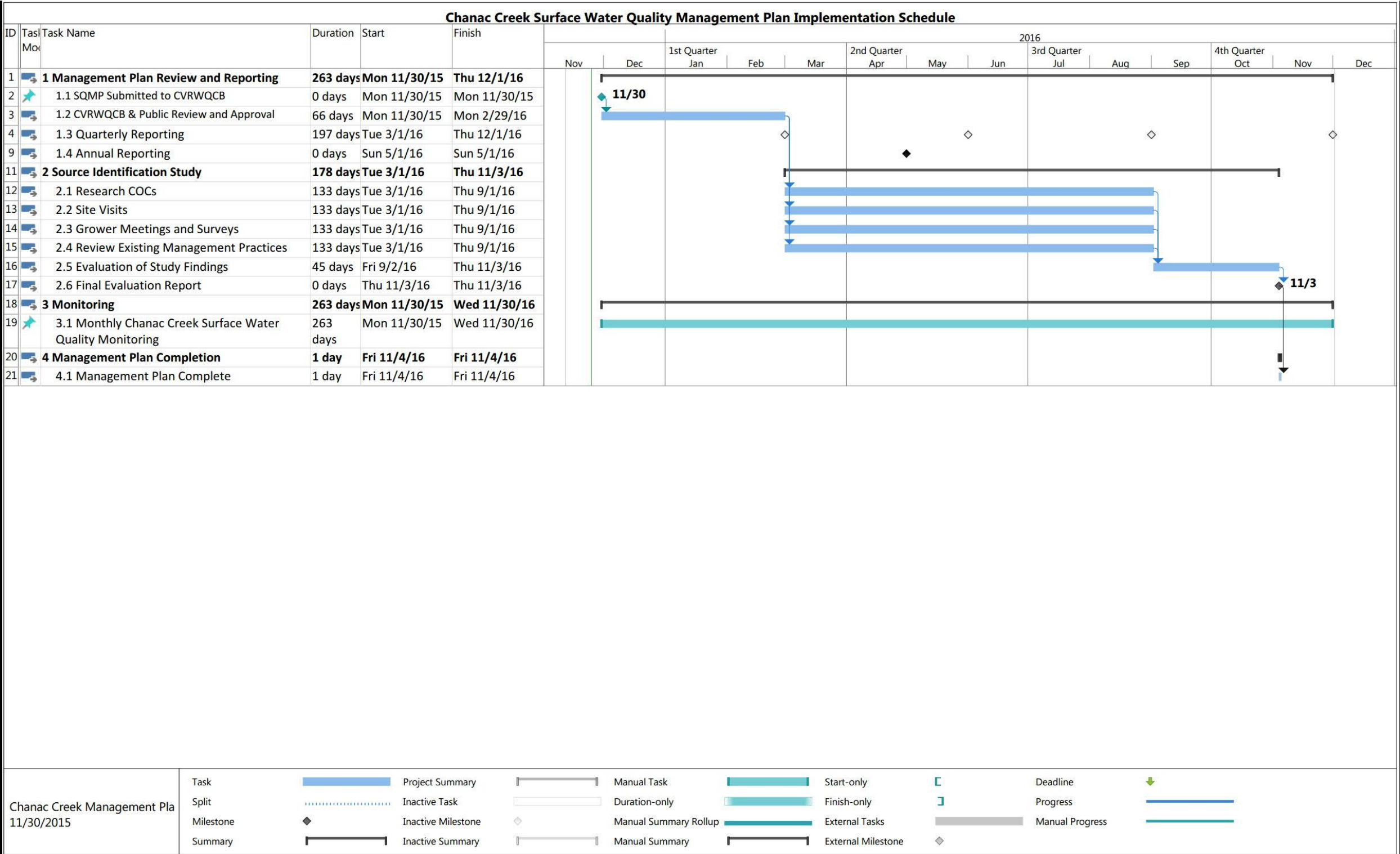


Figure A-1. Chanac Creek SQMP Anticipated Schedule (assuming completion after Source ID Study)



Chanac Creek Surface Water Quality Management Plan Implementation Schedule																																													
ID	Task Mod	Task Name	Duration	Start	Finish	2016												2017								2018																			
						Quarter	1st Quarter			2nd Quarter			3rd Quarter			4th Quarter			1st Quarter			2nd Quarter			3rd Quarter			4th Quarter			1st Quarter														
						Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
1	📁	1 Management Plan Review and Reporting	785 days	Mon 11/30/15	Sat 12/1/18																																								
2	📁	1.1 SQMP Submitted to CVRWQCB	0 days	Mon 11/30/15	Mon 11/30/15																																								
3	📁	1.2 CVRWQCB & Public Review and Approval	66 days	Mon 11/30/15	Mon 2/29/16																																								
4	📁	1.3 Quarterly Reporting	719 days	Tue 3/1/16	Sat 12/1/18																																								
17	📁	1.4 Annual Reporting	521 days	Sun 5/1/16	Tue 5/1/18																																								
21	📁	2 Source Identification Study	178 days	Tue 3/1/16	Thu 11/3/16																																								
22	📁	2.1 Research COCs	133 days	Tue 3/1/16	Thu 9/1/16																																								
23	📁	2.2 Site Visits	133 days	Tue 3/1/16	Thu 9/1/16																																								
24	📁	2.3 Grower Meetings and Surveys	133 days	Tue 3/1/16	Thu 9/1/16																																								
25	📁	2.4 Review Existing Management Practices	133 days	Tue 3/1/16	Thu 9/1/16																																								
26	📁	2.5 Evaluation of Study Findings	45 days	Fri 9/2/16	Thu 11/3/16																																								
27	📁	2.6 Final Evaluation Report	0 days	Thu 11/3/16	Thu 11/3/16																																								
28	📁	3 Management Practice Implementation and Evaluation (IF NECESSARY)	562 days	Fri 11/4/16	Mon 12/31/18																																								
29	📁	3.1 Grower Outreach and Education	41 days	Fri 11/4/16	Fri 12/30/16																																								
30	📁	3.2 Possible Management Practices Implementation for DDE	261 days	Mon 1/2/17	Mon 1/1/18																																								
31	📁	3.3 Possible Effectiveness Evaluation of DDE Management Practices	260 days	Mon 7/3/17	Fri 6/29/18																																								
32	📁	3.4 Possible Management Practices Implementation for Molybdenum	260 days	Mon 7/3/17	Fri 6/29/18																																								
33	📁	3.5 Possible Effectiveness Evaluation of Molybdenum Management Practices	261 days	Mon 1/1/18	Mon 12/31/18																																								
34	📁	4 Monitoring	805 days	Mon 11/30/15	Fri 12/28/18																																								
35	📁	4.1 Monthly Chanac Creek Surface Water Quality Monitoring	805 days	Mon 11/30/15	Fri 12/28/18																																								
36	📁	5 Management Plan Completion	592 days	Fri 11/4/16	Mon 2/11/19																																								
37	📁	5.1 Review Source Identification Study, Monitoring Data, and Management Plan Effectiveness (IF NECESSARY)	592 days	Fri 11/4/16	Mon 2/11/19																																								
38	📁	5.2 Management Plan Complete	592 days	Fri 11/4/16	Mon 2/11/19																																								
Chanac Creek Management Pla 11/30/2015																																													
Task		<div></div>	Project Summary	<div></div>	Manual Task	<div></div>	Start-only	<div></div>	Deadline	<div></div>																																			
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Milestone		<div></div>	Inactive Milestone	<div></div>	Manual Summary Rollup	<div></div>	External Tasks	<div></div>	Manual Progress	<div></div>																																			
Summary		<div></div>	Inactive Summary	<div></div>	Manual Summary	<div></div>	External Milestone	<div></div>																																					

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# **Appendix B**

# **GIS Shapefiles**

**Surface Water Quality Management Plan – Chanac Creek**

*(See included CD)*